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# East Europe Report

SCIENTIFIC AFFAIRS

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3 January 1984

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CEMA COUNTRIES INTENSIFY S&T RESEARCH COOPERATION

Academy of Sciences Cooperation

East Berlin PRESSE-INFORMATIONEN in German No 133, 15 Nov 83 p 2

[Article by Dr Claus Grote, General Secretary, GDR Academy of Sciences:  
"Socialist Academies Intensify Research Cooperation"]

[Text] The results which were achieved together over the past 2 years point to a considerable intensification of multilateral cooperation in science as a part of socialist economic and scientific-technical integration of the CEMA countries. The essential aspect of this process is the conscious endeavor --launched by all academies of sciences of the socialist countries equally-- to achieve a higher share of results that can be used in the national economy than has been the case until now in the context of the directions that are strategically decisive for their countries.

Both the total of 14 natural-science and nine social-science multilateral problem commissions, in which scientists from various academies worked in a goal-oriented manner to accomplish key projects, and the four international installations for advanced training of scientific cadres did comprehensive work.

New Quality of Chemical Fission Processes

In the field of the natural sciences, for example, it was possible, in petrochemistry, to determine, for a special hydrocarbon pyrolysis, the influence of various polycyclic aromatic substances and alcohols on the yield of fission gases and their composition. Cooperation was coordinated in a multilateral fashion and was carried out primarily with the Academy of Sciences USSR. Among other things, it led to important discoveries on the methodology and equipment for pyrolysis investigations.

In the context of the social sciences, among other things, guidelines were issued to explore, recognize, and illustrate conditions and action modes of objective laws on the further fashioning of the developed socialist society. Activity in the corresponding study groups led to a more profound understanding of the interaction between central government planning and the planning activities of the economic units based on individual responsibility.

The research efforts of our [East German] Academy on reproduction-theory questions of scientific-technical progress, using the example of microelectronics, met with growing interest here.

During the past 24 months it was possible further to define and coordinate multilateral cooperation. For instance, with the active cooperation of the Academy of Sciences of the GDR, the multilateral Problem Commission on Physical-Technical Problems of Energy Science was founded; its task groups have in the meantime begun their activities. That includes the electrical physics and electrical engineering groups, as well as low-temperature plasma physics, for which sections of our Academy assume responsibility for international coordination. The work of this Problem Commission will considerably enrich research activity in the field of energetics which is decisive for our national economy's economic strategy.

Streamlining work was also done in many other already existing problem commissions and this effort contributed to the further concentration of joint research activities in national economic priority areas. New CEMA base laboratories--which, as joint research installations with unique equipment for certain complexes, represent one of the most effective forms of multilateral cooperation--were formed within the context of the problem commissions on computer engineering, semiconductor physics, high-molecular compounds, kinetics, and catalysis, as well as petrochemistry. Overall, there are now 42 such laboratories attached to national installations which are available for use by other academies.

#### Cooperation to Be Developed

Representatives of the academies of sciences of socialist countries in Budapest recently reviewed multilateral cooperation in their installations which is marked by a growing degree of obligatoriness. At the same time they agreed on the most important steps and guidelines for further, target-oriented in-depth development of relations during the coming 2 years.

In the future it will be above all important to achieve considerably more profoundly developed cooperation in the field of computer engineering and data processing, one of the key problems for a decisive increase in the capacity of the most varied sectors of the national economy. The most comprehensive tasks over the next 2 years include the further qualification of the long-term program of multilateral scientific cooperation with the academies of sciences of the socialist countries until 1990 and beyond. In this connection, measures were adopted whose most important one is the specific definition of the individual science branches for the 1986-1990 five-year plan. As part of this complex, among other things, the Academy of Sciences of the GDR will revise the chemistry program and the Academy of Sciences USSR will revise the entire physics program.

A decisive guideline for this is the determination, made in Budapest, of a total of six research directions which were selected by the participating academies for the first time and which were unanimously designated as being priority items. This involves energetics, scientific equipment construction,

computer engineering and data processing, raw material sciences, biotechnology, and the exploration of natural resources.

Beyond the measures aimed at developing the content of further cooperation, the representatives of the academies of sciences also concentrated on additional organizational-methodological perfection of their scientific relations. It was thus considered required further to improve the network of existing CEMA base laboratories. The eight installations of this type existing in the GDR for the most part are involved in the geophysical sciences. The important thing for us therefore is to extend this very effective form of cooperation increasingly also to the other science branches.

The question of a stricter work procedure in the problem commissions is assuming growing significance. The important thing is to continue the concentration on current key projects and further to increase the concreteness of the problem statements. The establishment of target projects proved to be a very fruitful method in this sense; these target projects call for the solution of certain problems within a specified interval of time. This method must be further developed.

#### Electronics Industry Cooperation

East Berlin PRESSE-INFORMATIONEN in German No 106, 9 Sep 83 p 2

[Article by Felix Meier, Minister for Electrical Engineering and Electronics: "Socialist Economic Integration Benefits All"]

[Text] The economic strategy for the 1980's means that the ever closer interlacing of the national economies of the GDR and the USSR and cooperation within the CEMA offer the conceivably most favorable prerequisites for far-reaching advances leading to a higher level of the production forces. Combining the advantages of socialism more closely with the achievements of the scientific-technological revolution and constantly using them effectively are part of daily work routine in the combines, enterprises, and in the ministry. The spectrum of this common effort extends from regular exchange of workers, for example, between the "Wilhelm Pieck" Oberspree Cable Works VEB Combine of the Electric Machine-Building Combine VEB with partner enterprises in the Soviet Union, via regular work contacts with the general managers of the combines all the way to intensive conferences with the partner ministries of the USSR and the other countries of the socialist community.

The basis for this close science and production cooperation consists of numerous government and minister conventions; agreements, and contracts which represent a reliable foundation for economic division of labor for mutual benefit. The coordination of the national economic plans has for a long time proved to be the main method of coordination. The constantly growing volume of commodity exchange [trade] in the field of electrical engineering and electronics is an expression of dynamic development in the CEMA.

## Division of Labor Already in Research

An important link in the chain involved in the acceleration of scientific-technical progress is the accomplishment of research and development tasks, based on division of labor, above all in structure-determining fields, such as microelectronics, robot engineering, and computer engineering. The main directions have been coordinated for this. Specialization and cooperation in research and development, along with trade, are increasingly moving to the fore here. This is borne out, for example, by division of labor in the development and production of products of the ESER (Uniform Electronic Data Processing System) and the SKR (Small Computer System). This is where the effects of socialist division of labor become particularly visible.

The application of electronic computer engineering in the GDR has helped make the management and planning of the national economy more rational and has made it possible automatically to control production processes, to save material and energy, and effectively to support socialist rationalization in administrations and in payment transactions. The Robotron Combine VEB for example annually exports data processing and microcomputer engineering products worth about M3 billion to the USSR and to the other socialist countries. On the other hand, computer systems from those countries are being operated in the GDR. Just recently, the GDR turned the 300th computer system over to the Soviet Union. The computer will handle the book-keeping for operational ship employment and process statistical transloading volume data as well as figures on the fleet itself and the Baltic Maritime Shipping Company.

Since the conclusion of the first government convention on microelectronics between the GDR and the Soviet Union in 1977, the development, production, and use of microelectronic structural elements has taken place at a fast tempo due to cooperation with the Soviet specialists in the microelectronics industry. Specialization of the research and development potentials of the CEMA countries, aimed at key projects, is expressed in the rise in the domestic output and in increased trade involving structural components. The consequence of this is broad-scale use of microelectronics combined with a high national economic effect. Electronic controls for the machine-tool industry and industrial robots from the "Karl Marx" Numerik VEB, a large number of practical application examples in the most varied sectors of society, as well as a broader supply of modern electronic consumer goods for the population and for export--these are the results of the time gain deriving from science and production cooperation in the field of microelectronics. Here, the GDR's advantages--for example, the high level of the GDR's precision-mechanics-optical industry--take effect in the interest of the socialist community.

## Agreements Regulate Cooperation

A general agreement of the CEMA on multilateral cooperation in the creation of the "Uniform Base for Products of Electronic Engineering, for Technological Special Equipment, as well as for Semiconductor and Special Raw Materials and Their Production" provides for the GDR, among other things, to develop and produce precision-mechanics-optical instruments and systems, as well as analysis

control, and measurement equipment for the microelectronics industry. The scientists, engineers, and workers, among other things, at the Carl Zeiss Jena VEB Combine have a high responsibility for this. This marks the continuation of successful and creative cooperation with the USSR which is proving itself in the exploration of outer space and the remote exploration of the earth with products from the Carl Zeiss Jena VEB Combine, the Robotron Combine VEB, and other combines of the GDR.

There has been successful development in recent years also in the field of traditional electrical engineering. The "Interelektro" International Organization for Economic and Scientific-Technical Cooperation in the Field of the Electrical Engineering Industry was founded almost 10 years ago. The People's Republic of Bulgaria, the Hungarian People's Republic, the GDR, the People's Republic of Poland, the Socialist Republic of Romania, the USSR, Czechoslovakia, and Yugoslavia are closely working together in this organization on the basis of multilateral agreements. Member countries presently are developing and producing about 350 electrical engineering products in a coordinated fashion.

In managing the industrial sector, we devote great and constant attention to cooperation with the USSR and the other countries of the socialist community. It extends from personal work contacts with the specialized ministers in the CEMA partner countries all the way to the training of college and technical school cadres of the GDR in the Soviet Union and employment in the research and development installations of the combines in the industry sector.

Cooperation for further dynamic development of the industry sector received new and strong impetus from the friendship trip of the GDR party and government delegation to the Soviet Union under the direction of the SED Central Committee Secretary-General and GDR State Council Chairman Erich Honecker.

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SUMMARY OF REPORT FOR 1982 WORK OF ACADEMY OF SCIENCES, STATEMENTS

Sofia SPISANIE NA BULGARSKATA AKADEMIYA NA NAUKITE in Bulgarian No 4, 1983 pp 5-30

[Presentation by Academician Angel Balevski of the BAN [Bulgarian Academy of Sciences] Accountability Report on 1982 Activities; Abridged materials of the accountability session of the BAN General Assembly, which was held on 31 March 1983 at the academy's Grand Hall]

[Text] Since the report was distributed and those present here have read it, this very brief presentation will review only a few aspects of the organizational and managerial activities of the Bulgarian Academy of Sciences, mainly of the Presidium and some of its other organs, as well as some general indicators of the implementation of the academy's scientific research plan (which is, essentially, the academy's most important work) and that of the Kliment Okhridski Sofia University for 1982, and some of the more important directions and tasks of BAN activities for the following, i.e., the current year.

The 1982 work of the BAN took place under the sign of several important events in its life, which had a major impact on the updating and implementation of scientific plans and programs.

Like the rest of the country, the BAN acted during the period under review in accordance with the resolutions of the 12th party congress and the new theoretical formulations presented by Comrade Todor Zhivkov at the congress. Particularly important among them was his speech to the 12 april 1982 BAN General Assembly. In this speech, which was of programmatic importance to us, he outline the main tasks facing today our science and formulated the main problems which must be resolved by the scientific institutions and creative collectives. He noted the leading role which the academy must play in the accelerated development and enhancement of the level of the national economy by working on important scientific problems and developing new methods and technologies. This would enable us to achieve the harmonious development of advanced scientific ideas and the growing possibilities of industry to adopt and implement the new scientific results, which is a matter of great importance. Comrade Zhivkov stressed the importance of the new economic mechanism which is consistent with the requirements of science and the need for centralized target financing of programs, developments, and technologies of national importance. In this connection he ascribed exceptional importance to the role of scientists and scientific collectives of engaging in creative and constructive toil for the sake of the comprehensive development of our country and the



enhancement of its prestige in the international division of labor. As he emphasized, this logically leads to the need for broader popularization of the achievements of our scientists and the enhancement of their reputations. We suffer from a very grave weakness, for which I am perhaps to blame, in considering that popularizing the academy's past and present contributions are some kind of commercial publicity and are below the dignity of such an institution. This is actually not the case, for that which we accomplish we accomplish not for ourselves, or for the sake of our own knowledge. We have this knowledge, as it is, and its purpose is to put it to use by making aware of it our public, our scientific and technical public above all.

The stipulations expressed by Comrade Zhivkov are, in their totality, an important guideline and guiding principle in the overall activities of the BAN. It is on their basis that the academy's management and party committee approved specific assignments which are currently being developed.

The 25 January 1982 meeting between the Council of Ministers Bureau and the BAN leadership gave a new impetus to the enhancement of the role of the Bulgarian Academy of Sciences in resolving the problems of the socioeconomic development of the Bulgarian People's Republic. At this meeting, the first of its kind, it was emphasized once again that the BAN plays a leading role in our country in the development and intensification of the economy and in enhancing the level of the communist upbringing of the individual. In his statement on the academy's activities and the energizing of its participation in the work of the Council of Ministers, Comrade Grisha Filipov gave a high rating to these activities. He particularly noted the role of the social assignments of the scientific units of the academy in the practical application of the results of scientific work and the methods for improving application efforts. The BAN can and must answer some general questions of our development: how to establish a new type economy, a new type reproduction process, a new material and technical base for the future, and others.

It was on this basis that the new social assignments facing the academy were formulated. In accordance with the resolutions of the party and state organs on applying the economic approach, and on the basis of the stipulations expressed by Comrade T. Zhivkov at the BAN General Assembly, the Presidium submitted a draft decree on improving the academy's management and upgrading its role in managing and coordinating basic research, submitted for approval to the Council of Ministers. Comprehensive scientific programs were formulated on the development of the food complex through the year 2025 and for cooperation between the BAN and the Ministry of Machine Building and Electronics and the Soviet Academy of Sciences in instrument making and automation, a program for the development of the academy's material and technical base through 1990 and the BAN program for scientific research in power industry.

The Presidium's activities related to regional problems were developed further. Minutes were accepted and contract were concluded on providing scientific assistance to Burgas, Varna and Razgrad okrugs (for 1982, for we have concluded contracts for such programs with other okrugs and areas as well). A cooperation contract was concluded for cooperation with the BCP Central Committee Academy of Social Sciences and Social Management and the Kiril i Metodiy University in Veliko Turnovo. The BAN program for Blagoevgrad

Okrug (the oldest academy program) was updated. Ties and mutual aid with the Sofia City People's Council and the city's economy are intensifying further and further. A joint document has already been drafted and is about to be initialed on giving the capital scientific help.

In the area of long-term planning, the Presidium is increasingly relying on the problem councils and its commissions, some of which have already significantly improved their work, although, actually, we cannot consider it satisfactory yet. This applies to the Bulgarian food complex and biological resources, the social sciences, the material and technical base of science, the Man and His Environment Program and the Strandzha-Sakar Regional Program (developed by the academy since 1955). The Problem Council on Biotechnology was set up by the end of 1982. It is a very promising comprehensive scientific line. Naturally, we have created organizations which will deal especially with biotechnologies, but on a level consistent with the nature of the BAN as a higher scientific institution, on the one hand, and, most importantly, a comprehensive one, on the other. For although this may appear somehow one-sided, or give the impression of dealing with a specific area -- biology -- the problem is quite complex and requires the use of other sciences as well.

The process of improving the academy's organizational structure was continued on the basis of a selective scientific strategy consistently followed by the academy's leadership. The changes were aimed at ensuring conditions for a better organization and having a more competent and specialized management of some scientific areas and practical science activities. It was mainly through the concentration of available cadres and material resources that the Central Laboratory for Seismic Mechanics and Seismic Engineering, the Central Control Systems Laboratory, the Social Sciences Scientific Research Laboratory in Plovdiv and the Laboratory for Marine Chemistry in Burgas were set up. Expedient structural changes were made in some units of the Unified Biology Center, based on the problem principle. A laboratory for biotechnology and microbiology was set up in Plovdiv, under the Microbiology Institute. Activities on instrument making and automation in biological experimentation were concentrated within a single unit. New structures were developed and approved for the scientific units of the Scientific Art Studies Association and the Institute of Metal Studies and Metal Technology, for the same purpose. Partial changes were made in the structures of the Sociology Institute, the Technical Cybernetics and Robotics Institute, the Main Hydrology and Meteorology Administration, and others. In order to improve the organization and leadership of the BAN Presidium in major areas of activities, a Science Propaganda Council and a Council on Work With Youth and the Komsomol were set up under the academy's Presidium. I have already said a few words on scientific propaganda, which we consider to be of exceptional importance. The Czechoslovak academy, for example, has 15 people who deal especially with scientific propaganda. This is not a question of garish promotion but of something exceptionally important: informing those who are interested in what has been accomplished. This is also a question of national self-confidence. I have noticed that few of the academy's accomplishments are known by our people and that once they are, they are welcomed by the people with particular satisfaction. In the final account, this is a yardstick of the intellectual standard of the nation.



The successful application of the economic approach and the specific mechanism . for its application in carrying out the academy's tasks and meeting the requirements of the basic ideas of the party's concept on a new labor code call for further improvements in the organization of scientific activities. It is in that sense that we must assess the structural changes made so far in the scientific units and the effectiveness of some new forms of organization of the research process, such as problem groups, temporary collectives and others and, on this basis, continue with the process of coordinating the organization of the work with the new requirements.

The question of discipline is and will remain a particularly important element of this process. This question has steadily faced the academy's management and that of its units. Steps were earmarked to eliminate weaknesses and violations. Control over activities and discipline was provided administratively through the unified control system and the public organizations within the BAN. Although some successes were achieved, major violations of the labor discipline in individual collectives, weaknesses in the discipline and organization of administrative-managerial work, etc. remain. The important and responsible assignments set in Comrade Zhivkov's speeches and statements and, particularly, the stipulations of the party's concept on a new labor code call for a reinterpretation of the content and role of the discipline, and control and self-control of the labor collective in carrying out the academy's scientific research plan. This is an exceptionally important problem. Naturally, administrative control over discipline in an institution which produces something, which manufactures something tangible, is quite easy. We can tell a person to move a certain number of wheelbarrows of dirt from one point to another, but it is very difficult to discipline the person's mind so that he will not waste his time and will concentrate instead of engage in wool gathering. Unfortunately, however, some existing objective conditions encourage deconcentration rather than concentration of the mind. This is an exceptionally delicate matter which cannot be settled by decree or order or else, if you wish, a pious wish. It is a continuing process.

There must be discipline in the BAN, but it must be of a specific nature. There must be stress in the academy, but it must be an inner stress stemming from the intensive thinking of the people, thinking about things which have captured their entire being. However, there should be no stress coming from the outside, for this kind of stress wastes the strength of the people and yields no results. The academy is a highly complex institution difficult to handle, which must be dealt with quite carefully, for it is not the management which does the work of the academy. The work of the academy is done by its scientists. The academy's management must create a certain type of atmosphere and implement the policy of the party and the state.

Let us point out the very good interaction existing between the Presidium, its Bureau and Scientific Secretariat, on the one hand, and the party, trade union and Komsomol committees and the Committee for State and People's Control, on the other, with which joint meetings are held. Such unity of action contributes to concentrating the attention and efforts on the main tasks and, hence, on upgrading the efficiency of the work of the academy's functional organs. During the year under review as well the BAN party committee discussed at its expanded plenums, with the participation of the party and scientific

leaderships, topical and important problems related to the academy's life and activities. The discussed items and decisions made helped to determine more fully achievements and weaknesses in scientific and party work and to harness the efforts of the entire collective for the successful implementation of its tasks. During the year the activities of the academy's leading organs closely interacted with those of the BCP Central Committee Science and Education Department, the city party committee and the Lenin Rayon BCP Committee. Regular and efficient ties were maintained between the leaderships of the academy and the State Committee for Science and Technical Progress and between their executive organs in resolving long-term and current organizational problems.

In 1982 the five-year plan was updated and made consistent with the stipulations contained in Comrade Todor Zhivkov's reports and statements and the decisions of party and government organs. The plan included more than 70 social assignments issued by economic ministries and transmitted via the Council of Ministers. The Basic Research Comprehensive National Program was updated as well. The main guideline in the implementation of the 1982 plan was the implementation of the Basic Research Comprehensive National Program and the scientific support of the strategic directions of scientific and technical progress through participation in the implementation of the other eight national programs and sectorial and intersectorial programs.

The plan includes three main subprograms for basic and applied research, covering a total of 132 problems, as follows:

First, natural-mathematical and technical sciences -- 70 problems, 28 of which on the national level.

Second, social sciences -- 48 problems, 12 of which on the national level.

Third, preservation and reproduction of the environment -- 14 problems, all of them on the national level.

Work was done on a total of 2,608 problems rather than 2,602 as required by the 1982 plan. Of these, 1,118 problems (42.87 percent) were developed on the national level. Broken down by scientific area, the program tasks were the following:

- natural-mathematical and technical sciences, 1,985, 346 of which completed and 194 submitted for practical use;

- social sciences, 623, 137 of which completed and 16 submitted for practical use.

The determining factor in the fulfillment of the 1982 plan was the process of strengthening the ties and interaction between the Basic Research Comprehensive National Program and the remaining comprehensive national programs for scientific and technical progress. Compared to the beginning of the five-year plan, the overall number of tasks directly related to the eight programs we indicated has increased by some 35 percent, so that 256 tasks in the Basic Research Program were directly related to these programs in 1982. This will ensure the implementation of 22 percent of the total number of tasks included in this program as early as during the 8th Five-Year Plan.

Considerable concern and attention were shown for the programs for regional scientific cooperation with a number of okrugs and areas in our country. The number of such programs rose to eight, totalling 504 tasks, in 1982. Integration relations between the BAN and Sofia University and the country's VUZs -- the Medical Academy, the newly created Agricultural Academy, and the Lenin Higher Machine and Electrical Engineering Institute -- are increasingly widening and intensifying. A cooperation contract was initialed in 1982 with AONSU [Academy of Social Sciences and Social Management] and Kiril i Metodiy University in Veliko Turnovo.

Effective cooperation with the USSR Academy of Sciences on problems related to the 11 comprehensive target programs and other items of bilateral cooperation and with the academies of the other socialist countries, on a bilateral basis, was an important factor in enhancing the standards and efficiency of our research work during 1982.

The study of the reports submitted by the unified centers and autonomous scientific units of the BAN and the Kliment Okhridski Sofia University on the implementation of their 1982 plan indicates its successful completion.

The results of basic and applied scientific research in the natural-mathematical, technical and social sciences are contributing both to the development of the sciences themselves (which is very important) and to the enhancement of their economic and social effect. Significant results were achieved also in meeting the assignments contained in the eight comprehensive national programs for scientific and technical progress, in which the share of participation by the academy and the university increased considerably during the year.

The tasks included in the organization and coordination contracts concluded with the economic ministries, which proved to be an efficient method for relating most closely scientific and applied academic research to the requirements of the present and future development of the respective economic sectors are being successfully implemented. Substantial results were achieved in the area of inventions and patent and license activities of the academy and the university. The successful implementation of the scientific research plan, the high standard of applied science developments and the good relations established with the economic ministries enabled the BAN in 1982 to apply 131 of its scientific developments with proven economic effect in excess of 137 million leva and economic contribution to the national economy of about 81 million leva. The economic results for the first 2 years of the five-year plan -- 1981 and 1982 -- total 282.5 million leva, thus overfulfilling the promise made by the BAN for the 8th Five-Year Plan. At the 12th BCP Congress we pledged to submit developments and ensure applications with documented economic results in excess of 282 million leva.

With its scientific potential in the natural and mathematical sciences totalling 7 percent of the country's scientific potential, the academy accounts for about 30 percent of the country's economic results of scientific and technical accomplishments. For example, we cannot expect of the History or Fine Arts Institute to apply something which will yield economic results in terms of cash. Therefore, the 7 percent of the country's economic potential, concentrated within the academy, accounts for 30 percent of the economic results of all scientific and technical achievements.

BAN regional scientific cooperation with and aid to individual okrugs and regions, including Sofia's economic and sociocultural life significantly increased in 1982.

In 1982 the USSR Academy of Sciences and the BAN recognized the first joint Soviet-Bulgarian discovery: "Patterns in the Crystallomorphic Evolution of Minerals in Mineral-Forming Processes." This was a joint discovery by the Komi branch of the Geology Institute, the Leningrad Mining Institute and the BAN Institute of Geology. The group of authors was headed by Prof Dr D. Grigoriyev from the USSR Academy of Sciences and Academician Iv. Kostov from the BAN. The discovery was submitted to the INRA [Rationalizations Institute] for obtaining a discovery diploma after the legal period of time has elapsed: A discovery diploma may be granted not before one year after the submission of the discovery, during which eventual objections may be filed. The USSR State Committee for Inventions and Discoveries issued Discovery Diploma No 244, dated 22 December 1982, for "Pattern of Changes in the Radius of Strong Proton Interaction at High Energies." The discovery was made at the Joint Nuclear Research Institute in Dubna by a group of authors consisting of 11 Soviet and two Bulgarian scientists -- Corresponding Members P. Markov and V. Zayachki.

The works of other academy and university scientists as well were given a high rating in 1982. Academician R. Georgieva and Prof V. Pavlova were awarded the title Hero of Socialist Labor. Nine scientists were awarded the high title Dimitrov Prize Laureate; four were awarded the title People's Worker in Science and 13 the title Honored Worker in Science, Art and Culture. Fifteen young scientists and specialists were awarded Dimitrov Komsomol prizes.

We are pleased with the results of 1982. They were for last year, however, and we are currently engaged in the implementation of the plan of the BAN and the Kliment Okhridski Sofia University for 1983, which is the decisive year for the implementation of the 8th Five-Year Plan. We are faced with important problems set by the 12th BCP Congress and in the spirit of the creative stipulations formulated by Comrade T. Zhivkov of comparing all of our achievements to those reached elsewhere in the world and considered as the highest development of the contemporary scientific and technical revolution, rather than using our own measurement scales. The building of a mature socialist society in our country is inconceivable without the most active participation of science. We must secure a strong scientific support for our economy.

Considered from the level of these party formulations of the role and tasks of the BAN as the highest comprehensive and leading scientific organization in the country, we cannot consider ourselves satisfied by the accomplishments. We see how many important problems remain unresolved, awaiting fast and urgent solutions. The academy is slow in reorganizing its work from extensive to intensive. The scientific topics in many institutes remain insufficiently coordinated. Although not totally, coordination with the most promising trends in the country's scientific and technical and economic policy remains insufficient. Some scientific units continue to waste forces and facilities on petty topics and tasks. Naturally, this cannot lead us to the most important feature which the academy should strive to find and reach: remaining on the highest possible level. Steady enhancement of scientific standards is one of the most important BAN tasks.

The nature of these weaknesses is mainly subjective, and their elimination requires the adoption of stricter measures on the part of the academy's leadership and, particularly, the managements of the unified centers and scientific trusts (where the people competent in a specific area are employed), the scientific institutes and the other autonomous units. These leading organs must assume their rights and obligations, for we have noted that the unified centers and institutes are failing to exercise their rights. They have a number of statutory rights which they fail to use. Naturally, such rights entail responsibilities. Many problems which could be resolved by the individual institutes and unified centers are being resolved by the central management of the BAN, which is incorrect. It is incorrect because the central management has an overall view on matters and is not competent to deal with specific areas. A great deal must be done in this respect and steady efforts must be made along this line. Therefore, these leading organs must assume their rights and responsibilities and ensure steady control over the implementation of their research plans and their periodical updating, and competently to direct forces and facilities into the timely and qualitative implementation of the priority assignments of the plan, which should yield considerable scientific, social and economic results. This year the BAN leadership should refine these priority tasks of national importance to the development of science and scientific and technical progress and create the necessary prerequisite for their programming and specific backing with the necessary resources.

In this respect major difficulties arise as a result of budget limitations. We are frequently totally unable to accomplish something because of lack of funds. This makes increasingly difficult the qualitative implementation of a number of important scientific research tasks and the application of the target approach in financing.

The USSR Academy of Sciences held its general meeting recently. All its foreign members were invited. I recorded some data from the meeting, which impressed me greatly. The capital-labor ratio per Soviet Academy scientific worker averages 113,000 rubles, compared to 11,500 leva per Bulgarian Academy worker, which means that the possibilities of the former are tenfold greater. Naturally, it is high time to do something more substantial. We have planned for 1985 a 15,000 leva capital-labor ratio, but it is obvious that such funds will not allow us to advance at a fast pace. Modern science is a rather expensive luxury. Naturally, we are not developing sciences which demand a great deal of money. We are lucky to be able to use the Soviet institutes in these sciences, such as the Dubna Joint Nuclear Research Institute. Could we have been able to build the Dubna installations used by our scientists? No, naturally. However, we need equipment, instruments, facilities, etc., which are not of that nature and which the other academies have in large numbers. The fact that we are a sought-after partner indicates our high scientific level. No one seeks a partner who will be hanging on his neck and will be hindering him, and every one looks for a useful partner. We cooperate on an equal footing.

When the institutes were being established we were sending young people to specialize in the soviet Union. We describe this as cooperation, which it is not. It is aid, specialization, etc. We went through this stage, however,



and today our cooperation consists of working on some problems jointly by institutes of equal capability, with each partner assuming his share and being responsible for it. No other way is possible, for otherwise we would not be a desired partner. We are still being sought after, but if the situation with material facilities does not change, and if we rely exclusively on the stress of the people and their inventiveness we can reach a certain point beyond which we would become an undesirable partner.

The reorganization of the work of the BAN from extensive to intensive development calls for speeding up the legal settling of a number of problems related to the organization and management of scientific research and application in the spirit of the new economic approach. The special directive on the BAN, which was submitted for Council of Ministers approval, calls for improvements in a number of its organizational and managerial functions and activities related to planning, accounting, control, financing, contractual relations with economic ministries and other customers and management and control of basic research in our country. An alarming lag has developed in the development of the academy's computer base. A very alarming lag has developed also in the use of modern means for the automation of scientific experiments, information servicing and managerial activities of the BAN, without which a conversion to intensive development is inconceivable. The academy's computer equipment has fallen substantially behind both in comparison to the academies of sciences of the other socialist countries as well as a number of other departments in the country, which are much better off in this respect. The computers of the unified series at our disposal are insufficiently powerful and morally obsolete. They prevent the development of a system for collective use with a developed network of terminals. In order to resolve complex problems the academy is forced to spend a considerable amount of its already meager funds renting computer facilities from other departments. This is a temporary and partial solution which meets a small percentage of actual requirements. The existing situation must be reviewed once again this year, together with the existing needs and actual possibilities for their satisfaction, and the necessary steps must be taken to ensure the best possible servicing of the BAN with computers by the end of the five-year plan. At the same time, a long-range program must be drafted ensuring the overall resolution of this problem within the shortest possible time.

Priority must be given to resolving the problem of the timely delivery of the planned two powerful computer systems and respective microcomputers and terminal systems required in order to automate scientific research and the information and management activities of the institutes and unified centers and the BAN Presidium.

The tasks formulated in Council of Ministers Order No 10 of 1981 on the development of scientific instrument making within the academy's system remain unresolved. You are aware of our difficult situation which will become even worse in the confrontation with Western countries. We are speaking of perfect technologies and their creation and application. However, this is impossible without scientific instrument making and an element base, for these are automated technologies. We purchase abroad many elements and a large amount of equipment and are currently facing an exceptional amount of difficulties in the development of this sector. The academy has a great deal

of possibilities which are simply left unused. In the past, when institutes were being established, we would say, for example, that we needed a physics institute. Funds would be allocated for the creation of such an institute, but no one would say what the purpose of the institute would be. People were then sent to specialize abroad and at home, and every one chose his own work topic. Now, however, when the work of these physicists is planned, coordinated and directed, and when they, like the scientists in other institutes, are producing many things, their achievements are not being or cannot be put to practical use.

The Lithuanian Academy of Sciences has 15 institutes. We have 70 scientific research units. It has four experimental plants and three experimental design and engineering bureaus. Obviously, that which is created by the academy is immediately applied. In this respect our hands are entirely tied. But there also is something far more important: For example, a biologist is making an experiment and develops an idea about combining some elements in order to determine a certain value, control some process and obtain a combination which constitutes an apparatus based on a new principle. This apparatus, however, is not commercially produced yet. We can claim that we have created it, but we need a workshop with designers who will combine more expediently these elements, eventually substitute better ones for them, give us a design and make all of this a commercial commodity. The question is not so simply resolved even in our institute, where most of the people are engineers and which has a design bureau where the constructive work takes place. Yet this is a necessary step. Meanwhile we, at the academy, are deprived of such facilities and, let me repeat this, creations are not put to practical use and become obsolete and rusty.

The elaborated comprehensive target program includes 31 topics on instrument making, 23 of which are being developed jointly with USSR Academy of Sciences groups. During Academician Aleksandrov's visit to our country we signed a letter requesting that the size of our cooperation be doubled. You should know that the problem is not ours alone. America has at its disposal the scientific potential of Japan, Britain, Germany, France, Italy, Spain and the other small capitalist countries, of old countries with old science. The Soviet Union must compensate for this entire tremendous scientific potential. It needs our help as well, and looks for it, the way the Americans look for the help of others. All of this has reached by now such a tremendous size that even the largest countries cannot meet all of their needs for scientific research by themselves. Science has become a huge sector involving huge funds and many people.

In 1982 the academy developed goods and scientific equipment worth 3.7 million leva, although the planned figure was for 6.1 million. The successful implementation of the tasks listed in Council of Ministers Order No 10 of 1981 on the development of scientific instrument making demands taking decisive steps by the BAN leadership and the unified centers, and the active assistance of other institutions in the timely financing of assignments, securing capital investment ceilings and acquiring the most necessary work premises. After completing a study of possibilities, the academy must actively join the I. V. Kurchatov Nuclear Energy Institute in the development of electronic control systems for nuclear electric power plants, so that our country may specialize

in this important and promising area of the nuclear power industry. We have specialists who can cooperate with the Soviet scientists on an equal footing and we must accomplish this at all cost. We also can develop special materials for nuclear power, which is also of exceptional importance. In the past, when assignments were being issued, we began by manufacturing in Pleven doors made of heavy steel which had to be imported. Labor accounted for 15 percent of the cost and materials for 85 percent, and the waste of such materials certainly accounted for 30 percent of the total or more. Our position is not very enviable. Today, when the opportunity has been given to us, we must use it and assume an important share which, most importantly, will stimulate the development of science itself. The doors made in Pleven require no science whatsoever, whereas our contribution to this cooperation does.

The shortcomings within the system used in procuring imported equipment and materials are a major hindering factor in the experimental and applied activities of all BAN units. Such shortcomings have been reported year after year at each academy accountability meeting. They have become one of the very serious hindrances along the path of intensive development, for it is inadmissible to order apparatus and materials which will be received a year and a half or 2 later, after they have become obsolete. No further postponements should be allowed in the establishment of a specialized foreign economic activities office under the BAN Presidium, which will study the market and realize the scientific and scientific and technical accomplishments of the academy abroad (we already have cases in which the achievements of our academy have been realized abroad through joint enterprises), and which will organize and rapidly procure, from domestic or foreign markets, the machines, systems, apparatus, equipment, materials and chemicals needed for the academy's research work. This is very necessary, for we are forced to wait and lose time for minor things, and time is the most precious commodity.

Nor have publication problems been resolved entirely. There was a time when the BAN publishing house had reached the highest standards and the books published by the BAN were the best presented and on the proper level in all respects. This is no longer the case due mainly to the inadequate printing facilities and the low technical standard of the printing press compared even to domestic printing facilities. The BAN management must continue its efforts related to the publishing house and its presses with the help of the Committee for Culture in order to enhance our publishing activities and to improve the organization of the work, thus providing facilities for fast and high-quality printing. This is very important and construction is a very difficult matter. We must expand our printing facilities, but in the final account a slow rotary press could be replaced by a machine of smaller size but higher productivity. Our publishing facilities must have the latest equipment.

The development of a modern material and technical academy base is one of the decisive factors in intensifying the scientific research process and upgrading scientific work standards, quality and efficiency. The present capital-labor ratio per person engaged in scientific work in the BAN is several times lower than that of the academies of sciences in the other socialist countries and, as I already pointed out, about tenfold lower than that of the USSR Academy of Sciences. A large percentage of the scientific equipment has already become obsolete. The Metal Studies and Metal Technology Institute has a James-7



electronic microscope. We requested some spare parts from the manufacturer, who answered that "When we make something we anticipate that it will be used for a given period of time. You have exceeded this period by double the amount of time. We assume that anything produced within this series is no longer in use and are no longer producing spare parts for it."

One of the right ways for the further development and renovation of the material and technical base of the academy is the use of contractual work by the BAN for ministries, economic enterprises and okrugs. The normative documents drafted in the spirit of the new economic approach should be such as to provide resources for scientific research by our institutes, both from revenue based on contracts and economic results from the application of scientific developments. We must energize the interaction with engineering-technical and performing cadres in economic organizations and okrugs for the successful application of the newly developed technologies and other scientific accomplishments. It seems clear that there should be people in the enterprises with an understanding of and taste for such activities, who would lay the ground work in them and with whom we would keep in touch.

We must consider as positive the experience acquired so far in cooperating with ministries on the basis of scientific coordination contracts. A large percentage of the tasks they include are planned and related to the Basic Research Program. Consequently, their formulation is aimed at the development of a scientific base for the present and future progress of the respective ministries. It is also thus that we implement the great idea of organization and coordination contracts for close cooperation with the ministries for exerting direct influence by the BAN on the development of scientific and technical progress. Such scientific aid provided by the BAN should also yield some economic returns from the ministries, such as capital investments they would allocate for the development of the material and technical base of the BAN as was the practice several years ago. The regional programs with the okrugs should rest on the same economic base. This will help to strengthen the ties developed on a mutually profitable basis and will be consistent with the new economic approach. Do you know what curious things develop? Being a budget-supported institution, we feel obligated to submit our achievements for practical use. Sometimes, however, they are not wanted.

We developed special steels, and extruded from them in Pernik shapes far more efficiently designed and of lighter weight, for use in electric cars. Previously all of this had to be imported. This led to tremendous savings and, above all, raised the standard of the production process and quality. The application of these items was financed by our institute. The result is what the Turks used to do: They would ask for fried eggs, eat them and demand payment for having worn out their teeth while eating.

The comprehensive nature of the problems being resolved by the BAN and the Kliment Okhridzki Sofia University demands that this year even greater attention be paid to the creation of an efficient mechanism for tying more closely through the plan studies in the area of the social sciences to the national programs for scientific and technical progress. The solution of this problem is difficult. However, we must reach a solution, i.e., we must tie the basic and spiritual sciences to the natural and technical ones.

In the spirit of the decisions made by the BAN leadership, based on Comrade Todor Zhivkov's speech to the General Assembly, a Scientific Propaganda Council was set up under the Presidium, which formulated and adopted a program for its activities. Special commissions are currently being set up to deal with such activities under the unified centers and scientific trusts. Under the guidance of the newly created specialized council of the BAN Presidium and the commissions under the unified centers, and in the closest possible cooperation with the mass information media we must develop extensive and meaningful popularization work for the dissemination of the scientific accomplishments of the BAN, enhancing the reputation of the scientific workers and, most importantly, acquainting the public with our accomplishments, so that they may be put to practical use.

The new leading organs of the academy and the managements of the unified centers, elected in 1982, in closest possible coordination with the party and trade union managements and organizations, face the responsible task of securing the necessary material, scientific-organizational and political conditions for the successful fulfillment and overfulfillment of the tasks based on the plan for 1983, which is decisive in terms of the implementation of the five-year plan. Let me mention here something of exceptional importance.

In our academy we speak of guided basic research. Consequently, we have in mind that basic research will be conducted in relation to satisfying specific needs or scientific requirements. Consequently, once such research has yielded results, the chain of applied research and developments should be extended until the entire project has reached the level of industrial maturity and put to practical use. However, today we cannot develop and apply a non-existing science. Such a science must exist, must be created. If it does not exist what would we apply? We cannot develop a science if there is no consumer well aware of his needs, knowing what he needs today and will need tomorrow, and who is able to formulate his problems and present them to the academy. If such assignments are set, and under their pressure, science will advance, like it or not. The following interaction exists: science helps the development of practice, but modern practice as well must be on a level such as to stimulate the development of science. These are two facets of a single process, which should in no case be pitted against each other. We cannot develop practice separately from science and science separately from practice.

Statements (abridged):

Corresponding Member Dimitur Shopov

In 1982 the Presidium adopted a program on the food problem, the comprehensive program of the BAN and the Ministry of Machine Building and Electronics, in the field of scientific instrument manufacturing and automation of scientific research, developed jointly with the USSR Academy of Sciences, and a BAN program in the field of energy through the year 2000. New programs will be developed and adopted, such as the BAN program for the elements base, the program for new technologies, including biotechnology, a magnetic linings program, etc. Their characteristic feature is that they include important problems and topics. Their resolution will be based on the comprehensive

approach stemming from the comprehensive nature of the academy. The further organization and, particularly, the implementation of these programs will demand a great deal of energy on the part of all involved teams. Steady persistence and streamlined and detailed work plans ensuring specific results are needed, on the one hand, and steady updating of plans guaranteeing work on essential scientific and technological problems, on the other. If we are able to accomplish this the results will be quite considerable. This will mean that we are practically and accurately following the two roads to progress, i.e., that we are developing basic problems stemming from the logical development of science, which lead to new laws and specific technologies related to the country's economic progress.

Let me draw your attention for a very brief moment to the problem of scientific instrument making and automation of scientific research. For a number of reasons this is a strategic problem facing our country. Making scientific instruments and developing automated systems require work on a high scientific level. They are science-intensive and most closely related to the development of science itself and the level of industrial output. This creates conditions for achieving progressive structural changes in our industry and increasing labor productivity as well as freeing science and the economy from depending on importing many apparatus and instruments.

The decision was made at the 26th session of the Party and Government Commission on Economic and Scientific and Technical Cooperation Between the Bulgarian People's Republic and the Soviet Union to create in both countries subgroups for scientific instrument making and automation of scientific research. Such a unit has already been created in our country, and the academy has been assigned to manage it, as the leading organization. In this connection the comprehensive target program for cooperation among the BAN, the Ministry of Machine Building and Electronics and the USSR Academy of Sciences was submitted to the Party and Government Commission. It includes 31 topics, 23 of which are being developed jointly with USSR Academy of Sciences groups.

Academy unit sales totalled 3.7 million leva in 1982. Objective and subjective reasons prevented the academy from completing its assignment of reaching sales totalling 6.1 million leva in 1982. The subunits of the Unified Physics Center failed to earn 1.1 million leva from sales, while the Scientific Biological Research Laboratory failed to deliver even a single item.

An equally important problem related to the implementation of the program is that of resource support and, particularly, the utilization of allocated funds. A high percentage of the severely reduced funds are allocated at the end of the year, after the Bulgarian Foreign Trade Bank has stopped all payments. Let us not forget that scientific instrument making is a new sector in our economy, operating under the specific working conditions of the BAN, and currently developing its material base and accumulating working capital.

It was decided at the second conference of chairmen of academies of socialist countries for procurements through interacademic exchanges between the Bulgarian and Soviet academies of sciences to reach 20 million foreign exchange leva by the end of 1985. This decision calls for the establishment of a unit under the BAN Presidium, in charge of foreign economic relations.

On the other hand, academic exchanges will help to procure some of the elements needed in the production of automation items and systems.

The academy's activities in the area of scientific instrument making and development of automated systems must be conceived as far broader area than merely in the sense that it must have an output worth 70 million leva this five-year plan and 150 million the next. I think that it would be more accurate to view this problem in the sense that the academy should provide industry with developments which would make possible production worth that amount, while the academy itself will produce mainly separate and individual instruments and systems.

The successful solution of this problems will provide the academy with facilities for the manufacturing of instruments and systems which, transferred to industry, will ensure output worth several hundred million leva. All the necessary efforts must be made in this respect in order to reach the necessary technological stage in the developments.

Prof Tsanko Stoychev

The main task currently facing the leadership and collective of the Unified Biology Center is increasing scientific research efficiency. This task is based on the priority development of the biological sciences over the past decade and the steady increase in the role and social significance of biological research in terms of the development of the science itself, the intensification of agriculture and forestry, improvement in health care, development of new biotechnologies and products, environmental protection, and others.

The positive trends in terms of the improved efficiency and social significance of the developments of the Unified Biology Center are eloquently confirmed by the fact that their application in forestry, agriculture and the biological industry yielded an economic contribution of 24 million leva in 1981 and 36 million in 1982.

I would like to say a few words on the integration relations of the Unified Biology Center.

The many-sided and various areas of practical application of the results of basic and applied research in the field of biology make absolutely necessary the development of a single biological front with its systems -- general biology, medical biology, agrobiolgy, forest biology and biotechnology -- and the establishment of properly functioning relations with sectorial ministries and departments in charge of the respective areas and their scientific and applied science organizations.

I shall not discuss the integration relations between the Unified Biology Center and the Biology Department of the Kliment Okhridski Sofia University, which are regulated within the cooperation and integration framework of the BAN and Sofia University, or the integration relations between the Unified Biology Center and the other BAN unified centers. I shall touch very briefly on the integration relations between the Unified Biology Center and two large scientific organizations: the Medical and Agricultural Academies.

Cooperation with the Medical and Agricultural academies is necessary not only in order to concentrate and unify scientific cadres within a single medicobiological and agrobiological front but, above all, to accelerate and facilitate the utilization of scientific results achieved by the center and these organizations in health care and agriculture. That is why we try to strengthen and expand systematically and consistently our integration relations with both academies. Although some successes have been achieved, we are not still not satisfied with their level.

Cooperation with the Medical Academy is already traditional. Currently, the scientific personnel of both academies are working jointly on 10 coordinated programs. They have joint coordination councils, hold regular annual joint scientific sessions, organize joint courses for young scientific workers, and so on. Such cooperation has yielded valuable scientific and applied science results. However, they do not match increased requirements and the cadre and material facilities of either academy. Insufficient results have been achieved directly applicable in disease diagnosis, treatment and prevention, and even they are being applied with difficulty in medical practices. This is mainly due to the lack of vertical integration. The existing horizontal integration between molecular biologists, morphologists, biophysicists, physiologists, pharmacologists, etc., is good and absolutely necessary. We must emphasize that today new developments in medicine originate mainly in the field of medicobiological research, the high standards of which may be achieved only within the framework of such horizontal integration. Such integration, however, is insufficient. It must be successfully supplemented by a functional vertical intergration based on the problems principle, which would involve a variety of specialists, ranging from molecular biologists to clinicists and hygienists working on specific problems.

Until recently we were facing major difficulties in developing a united agrobiological front because of the scattered nature of the institutes within the NAPS [National Agroindustrial Union] system. The creation of the Agricultural Academy improved the possibilities of achieving effective integration in the agrobiological sciences. A cooperation contract between the BAN and the Agricultural Academy and an appended program for joint work on the most important problems have been drafted and are shortly to be approved. We are also experiencing great difficulties in determining the economic effectiveness of the application of our developments in agriculture. A joint task force has been now set up by the Agricultural Academy and the Unified Biology Center for the development of a unified method and the improvement of the mechanisms used in determining the economic effectiveness of the application of scientific developments in agriculture.

Of late the Unified Biology Center has come across several cases of rivalry, which are hindering the application of some results. There is nothing wrong for two collectives to be pursuing different methods in developing a specific technology, biological product, or plant or animal species. No one knows in advance which way will lead to effective results. However, once two technologies or two products have been developed and it comes to determining which is the better or more effective and should therefore be adopted, rivalries enter the game and if one of the collectives belongs to the applying organization it becomes hard to eliminate the subjective element in the evaluation. The

academy most interested in this matter should develop and submit an arbitration mechanism for the objective resolution of such rivalry problems.

Finally, in full accord with the statement of the comrade chairman on the unsatisfactory material base of the BAN, allow me to back it up with a few examples.

A breakdown of the academy's 1982 expenses and 1983 budget would show that wages continue significantly to exceed the amount of allocations for scientific research. What is alarming is that no improvement trend is visible in this respect. This is an indication of extensive scientific development, although we keep claiming that we are following the path of intensive development in scientific research.

Prof Simeon Nedyalkov

I would like to express a few considerations on the so-called ecological problems or, as we are still simplistically referring to them, problems of environmental protection and reproduction. Above all, it has been established and every one well knows that ecological research and ecological sciences are of the highest interdisciplinary nature. What has past experience indicated? Failures in production and science are precisely the result of the fact that so far we have been unable to apply these comprehensive studies. Let me give you a single example: Is there anyone who has not engaged in studies in Devnya? A number of studies have been conducted, but on an isolated basis, without a target. Finally, last year the okrug party committee and the plant's management were forced to ask the BAN to formulate a comprehensive program for ecological research and for the overall solution of problems facing Devnya. Such problems exist in many other places.

The national basic research plan has indicated the failures and what we should do about them. They lie in the lack of coordination and in feudalism, i.e., every scientific worker would like to work on specific problems only, although ecological problems cannot be resolved by a single specialist only. The experience of the collective headed by Academician Mako Dakov, doing comprehensive research at the Parandalitsa Reserve, proved that 51 specialists in different fields were needed for a single research site for all problems to be solved.

Today we no longer have simply ecology. We have electroecology, radioecology, industrial ecology, urban ecology, etc. These are scientific disciplines which have been created and exist, and work is being done in this area in the Soviet Union and other countries. We too are lagging in this respect and must catch up.

In expressing these views I believe that the time has come to reassess our ecology studies. This was indicated also at the theoretical conference which was held last year in Slunchev Bryag, attended by 260 scientific, in the course of which it was established that a great variety of views prevailed on the subject, tasks, objectives and terminology in the ecological sciences. The question was then raised of theoretically clarifying these matters and accelerating what is now referred to as the ecologizing of science which, naturally, leads to the ecologizing of education and public production.



Corresponding Member Kiril Serafimov

This is the first time in some 25 years that I have attended a BAN general assembly, at which we note with pride and great joy that the economic results and contribution which were made exceed the annual cost of maintaining the academy by a factor of four. This is indeed a very substantial, an exceptional result which must be emphasized. Unquestionably, it is the result of a decade of efforts by the academy's leadership and entire academic collective, with minor exceptions, in developing ties with industry and achieving good economic results. At the risk of being considered a prophet of doom let me hypothesize that we shall not be able to produce economic results worth 250-260 million leva every year. This is not the most important activity of the academy, and even if it were we have neither the forces nor the facilities to maintain such a high level of economic effectiveness of academic sciences, the more so since the existing domestic economic mechanism greatly hinders the evaluation of economic results of dozens of contracted and other developments, and that we are forced either to make a contract with the awareness that our economic results will be credited to other domestic organizations or else to refuse to do so, which runs against our patriotic duty. Dozens of other academic developments become part of the national economy and our reality without their great economic, prestige, social and comprehensive results being taken into consideration.

In this sense I shall add the following to the accountability report: For reasons unknown to me it did not mention Interkosmos. This is an area in which the academy participates with virtually all its units, such as the Earth Center, Physics Center, Chemistry Center, Technical Sciences Trust and others. Substantial results were achieved in this area last year. We were successful not only in developing space projects which all citizens can see but also in longer-term projects which will contribute to scientific and technical progress, defense, security and the further development of the fraternal socialist countries. Let us note the successful testing and already normal operations of two new Bulgarian instruments aboard the Salyut-7 Station.

In its 22 November 1982 issue PRAVDA carried a highly laudatory article on these two instruments, entitled "Space Everest." We have sources of creative daring and intensive work in the future, proving what Bulgarians can do, for the instruments in question are not the result of a single academic laboratory or even the BAN alone. They reflect the progress achieved in our radioelectronics and machine building, of the overall economic and scientific and technical progress achieved by our country.

Still in this connection I would like to emphasize a new activity being started at the academy, an activity about which we used to dream and which will close the science-production cycle: The building of enterprises and plants of the Bulgarian Academy of Sciences. Science is highly effective wherever the academy has its own application units. Currently our academy is building such enterprises in Plovdiv and Stara Zagora. These are the initial steps in an extremely difficult and stressed activity. It is also a dangerous one, for if it were to fail it would deprive us for many long years of the possibility of applying a number of achievements. That is why I appeal now to the BAN Bureau and Presidium, which have always paid great attention to this

matter, and to all our organs, the Presidium apparatus in particular, to surround with great care these enterprises, which are the harbingers of a spring for the academy in the development of its own high economic efficiency.

Corresponding Member Yordan Kasabov

Allow me to draw your attention to some more specific problems related to the practical utilization of scientific results and the accelerated application and scientific instrument manufacturing, which are of essential importance to the Unified Physics Center and which, under its guidance, are based on a specific standpoint and, we hope, a useful and constructive approach. I refer to the possibilities, unappreciated I might say, provided by organizing small-series experimental production facilities for specific science-intensive items yielding high economic and technical results in a number of directions. Typical among them are the so-called sensors and actuators or performing systems. As we know, this is a complex matter which includes a number of physical, technological and economic problems. That is why we do not notice in their case the typical exponential development of the digital element base which rests on the almost fantastic possibilities of contemporary microelectronics. This turns the "periphery," in the broadest meaning of the term, of sensors and actuators into a burden of the powerful modern microelectronic digital systems and causes considerable difficulties in the development of complex systems for automation and control of processes or equipment. The use of microelectronic principles and technologies in the creation of peripheral sensors and actuators promises major successes in the development of peripheral systems with small dimensions, high reliability and low consumption. Acoustical electronics, acoustical optics and integral optics promise many new exciting possibilities in the area of sensors and actuators.

Despite insufficient material facilities, the available scientific potential of the Unified Physics Center enabled us to undertake successful work for the creation, study and organization of small-series experimental production of some sensors needed by our country.

Through the combined efforts of the Institute of Solid State Physics, the Central Laboratory for Solar Energy and New Energy Sources and the Applied Physics Laboratory in Plovdiv, the Unified Physics Center created, developed and organized the experimental production of differential photoresistors with parameters superior to world standards. These items, which are produced at the Applied Physics Laboratory in Plovdiv, fully meet the needs of the Memory Systems Plant in Plovdiv. This has made our strategic production independent from imports. We shall soon complete experimental facilities at the Applied Physics Laboratory in Plovdiv for the production of special photodiodes developed by the Institute of Solid State Physics also for the Memory Systems Plants in Plovdiv. The still inadequate special assembling facilities at the Plovdiv laboratory are hindering their immediate application.

The Institute of Solid State Physics is also developing sensors for measuring pressure, gas and other flows, mechanical stresses, accelerations, etc. It will undertake the creation of combined sensors for gas chromatography and PH-metry. All such sensors are based on the principles and technologies of contemporary microelectronics. We definitely believe that small-series



experimental production shortens the science-production cycle in element making, and particularly in making specific components needed by the country in minimal quantities, the more so since, for understandable reasons, the large plants avoid the production of complex science-intensive small-series items, even though in most cases they are of critical importance in the production of items of strategic importance to the country. Clearly, with proven large-series markets, small-series experimental output could be "licensed" for production in a highly developed state to suitable large-series manufacturing plants. In this case as well we could expect an effective shortening of the science-production cycle not only in terms of specific commodities but the systems of which it is a part, for their development can be secured already during the small-series production stage.

Finally, bearing in mind that modern experimental equipment is nothing other than modern powerful technology, I would like to emphasize that maintaining technologically modern experimental production facilities would not only not hinder scientific research but would raise their experimental support to the necessary contemporary level.

Prof Georgi Miloshev

The Main Hydrology and Meteorology Administration is a scientific research and operational unit of the BAN. Its task is to provide meteorological, hydrological and agrometeorological services to party and state organs and any other organization without being affiliated with anyone of them, for that would subordinate it to strictly departmental interests.

The forms of hydrometeorological services are being steadily improved and enriched. They are based on the level of scientific knowledge reached in the fields of meteorology, agrometeorology and hydrology, on scientific and technical progress and the steadily growing practical requirements of the country. The state of the arts in world meteorological and hydrological sciences is such that they can and do make real contributions to the overall socioeconomic life of mankind. This is achieved mainly by greatly enhancing the decisive role of science and by assigning priority status to the major and important problems which enhance the level of hydrometeorological services to the economy and the social activities of the respective country. We benefit from the lucky opportunity of being able to use the rich Soviet experience, for the Soviet Union is one of the most advanced countries in the world in the area of meteorological services.

What are the major and most important tasks facing us?

The first is the development of long-term weather forecasting, paying particular attention to agrometeorological forecasting of the growth, development and shaping of the harvest of basic farm crops, undertaking in the future crop forecasts covering periods of several months or an entire season. We must also improve forecasts of river systems and main water reservoirs.

The second is to improve regional and local short-term weather forecasts, paying particular attention to specialized forecasts and timely warnings of incoming dangerous weather phenomena, such as freezing, frosts, hail, floods and other destructive phenomena.

The third task is to improve scientific-method services in order to combat hail more efficiently.

Fourth, we must organize scientific research for the utilization of atmospheric energy sources. This means the study of wind energy in our country with a view to its extensive utilization for economic purposes and the artificial stimulation of winter precipitation in the water basins of the main reservoirs in order to increase the volume of available water.

Another task is to undertake the systematic and purposeful forecasting of critical air pollution under some meteorological conditions throughout the country and in the basic industrial areas.

Still another is to upgrade the efficiency of biometeorological research on controlling vital processes through meteorological factors and the biological potential of the climate, for the sake of the proper development of sanatorium and resort activities, mass prophylaxis, treatment of various diseases and formulation of medical meteorological forecasts.

Most of these tasks are not new. They had already been included in the plans of the Hydrology and Meteorology Main Administration and Institute, but had not been resolved on the necessary modern level. As a result of this the science of meteorology has fallen behind practical experience, particularly in the scientific support and formulation of forecasts.

Naturally, the implementation of the tasks and elimination of existing weaknesses must be based mainly on the available cadre and material and technical potential of the BAN and mainly the Main Administration and Institute of Hydrology and Meteorology and related teams in the country working in the field of meteorology.

This requires directing and unifying the efforts of the other related units in the country, such as the Atmospheric Physics Section of the BAN Geophysical Institute, the Biometrology and Medical Climatology Section of the Resort Sciences and Physiotherapy Institute of the Physics Department of the Kliment Okhridski Sofia University and the Development and Application Base of the NAPS Directorate for the Struggle Against Hail. This will make it possible to eliminate the existing departmental lack of coordination.

Academician Evgeni Mateev

The statement of Corresponding Member Kasabov, deputy director of the Physics Institute, confirmed my impression of the tremendous importance of this achievement, an impression I had expressed during the discussions on the draft report of the BAN Presidium. We know that many large economic organizations in the world have been based on precisely such individual discoveries with, in themselves, may not make large-scale production possible. However, they are the center around which major complexes could be built. It seems to me that in this case we face something of this sort. Naturally, it is still too early to draw final conclusions, but not to study this aspect of the problem. It seems to me that it would be suitable for our leadership to advise the Unified Center to submit to the Presidium a report on the technological possibilities

of the organized utilization of these achievements after, naturally, establishing relations with the Ministry of Electronics and other respective Bulgarian economic organs. I repeat that it is too early to draw final economic conclusions but not too early to begin working in this area, for future developments may prove to be quite substantial.

This is a suggestion which I may formulate also as a question. Does the academy's leadership not consider that it is necessary to organize research along that line? It fully agrees with what we are discussing here. Let us then pass a resolution asking the Unified Center to submit a report to the Presidium on the technological foundations and possibilities and that economic studies be pursued on the basis of this report.

Corresponding Member Azarya Polikarov

My overall impression based on the accountability report as a whole is that a tremendous amount of work has been done. In my view, this is consistent with reality. A tremendous amount of work has been done and all of it has been presented in the report in a very compressed manner. Nevertheless, my first remark is that I have seen accountability reports of academies far larger than ours, which were far shorter but in which the basic features were outlined far more clearly. We see here a somewhat amorphous report which does not make clear the points around which matters have crystallized, what are the leading features and the most important accomplishments, etc.

My second point pertains to financing. Naturally, I do not wish to find myself in a most easily reached position of asking "Give more to our institute, our center, our section, etc." However, serious scientific periodicals have discussed the influence of worsened financing on the development of science. This means that the problem has existed and does exist, and I think that it is also of scientific interest and should be formulated on an academic level and developed, not only in the statements but also in the SPISANIE NA BAN. I may be generalizing, but this certainly applies to the Center for Scientific Information in which we have reduced our information services by approximately one half, for financial reasons.

Contemporary scientific periodicals have special charts showing the increased cost of periodicals throughout the world. This enables us to project the prices of periodicals 1, 2 or 3 years in advance and thus not be surprised. Nevertheless, every year we experience very great difficulties in maintaining our library stock of basic periodicals on nuclear subjects. I consider this to be an essential matter for the present and the future, should we violate the completeness of the sources without which no contemporary science can be developed in the modern civilized world.

Specifically, I submit that book procurement be assumed by the academy itself, eliminating the use of intermediary organizations which are frequently of no help, for to them this is only one of many activities among which this particular one is either ignored or suffers. In my view, if it were to become an activity of the academy itself, the timely and skilled procurement of publications would benefit considerably.

Academician Sava Ganovski

I have been an academician and member of this academy for more than 30 years. I must say that this is perhaps the first time that we are presented with such a rich accountability report for the past year, truly saturated with tremendous activities; secondly, I think that this is the first time that we are informed about the number of topics under development, developed, applied, and so on. Most importantly, we are told of the tremendous returns compared to the academy's budget, as repeatedly asserted, etc., etc. This, comrades, is a first instance in the history of our academy, to the best of my recollection of its past history and reports.

It is true, as we celebrate Marx's anniversary, and as he and Engels said, that capitalism can be restructured only through revolution, a revolution whose tasks are twofold: the economic, political and cultural reorganization of society and the reeducation of the working people, of man.

Our report is rich, but we have not fully covered that side of our activities. Perhaps there is nothing very much to report, but I think that we must report on the spiritual activities taking place, on the spiritual production which Marx mentions along with material production, the more so since in our socialist construction material and spiritual production are becoming increasingly integrated. Unquestionably, the cadres which created these tremendous accomplishments in a number of natural sciences did this by having evolved to a new level compared to yesterday. How was this accomplished? Clearly, through training, upbringing, higher education, and so on.

I think that it would also be suitable to report on the situation in the institutes: the type of creative atmosphere in them, friendship, cooperation, elimination of careerism, philistinism and egotism, and so on. This would be of great interest, for many institutes are still suffering from them. This is the other side, the ideological side, so to say, the ideological, political and other restructuring of our working people and cadres.

The enemy is waging a horrendous ideological and psychological warfare, and perhaps some attention should have been paid to that aspect. We mention the 12th congress. That same congress set the assignment of struggling for peace. It is to the honor of the academy that the day before yesterday, on the initiative of the BAN, we asked at the round table that the Balkans become a nuclear-free zone. Why not report that fact as well? The BAN has an entire committee fighting for peace, headed by Comrade Zarev. It should have been included in the report, for the main strategic task of the resolutions of the 12th congress is the struggle for the defense of peace and against war. How have our academy and the respective institutes fought the ideological and psychological war in defense of peace? I believe that this aspect should be included if the picture is indeed to be complete.

Prof Ivan Velinov

Could the report have been better? I would like to answer this largely rhetorical question from the viewpoint of unresolved problems of long standing, sometimes reaching the level of a paradoxical situation.

First of all, I am concerned by the statement that (and I quote) "We have still not found or created an efficient mechanism for increasing the economic influence on economic organizations in the application of the academy's scientific and technical achievements." Obviously, this is no easy problem, and its solution cannot be sought above all in the efforts of BAN scientists. However, as far as the superstrategic problem of a rational search for, study and comprehensive utilization of practical and nonrecoverable mineral raw materials and despite the achieved positive results, it truly remains the weak spot. It is pleasing to read on page 140 that "The discovery in the Bulgarian People's Republic of 'Patterns in the Crystallomorphic Evolution of Minerals in Mineral-Forming Processes' by a Bulgarian-Soviet scientific collective with the participation of our world-renowned scientist Academician Ivan Kostov, acknowledged in 1982, is the pride of our academy." However, at the same time it seem strange that the huge amount of his works on this problem were not suitably rated and used in our geological practices.

Is the lack of a mechanism the main reason, or are there other reasons related to the lack of professional competence, absence of prejudice and a feeling for the new or for our spiritual output mentioned by Academician Sava Ganovski? This is a true example of a paradox in our area. I shall not mention other cases and negative psychological experiences preceding the acknowledgment of similar scientific accomplishments. I am nevertheless convinced that currently the BAN lacks the necessary powers not only in exerting an economic influence on economic organizations in the application of scientific and technical accomplishments but also in actually coordinating basic scientific activities in terms of research. That is why our main attention is largely concentrated on the formulation of programs rather than the possibilities of ensuring their more efficient implementation.

The second question I would like to discuss is the possibility of developing basic geological sciences in the BAN, without which we could hardly hope for the full-fledged functioning of many important sectors and activities.

The Geology Institute of the BAN has well chosen cadres with good professional training, and it is no accident that our specialists are being sought in resolving complex practical problems at home and abroad. Despite the many reorganizations and single and double affiliations, the management of the BAN was able to preserve the institute's most rational kernel and to create conditions for the birth of other scientific units with which the institute is closely linked.

The problem of intensification of geological scientific activities must cross a number of thresholds in the struggle for normalization. The transportation facilities not only for geologists, but also for geographers, botanists and other academy specialists are small and showing worsening trends, precisely now when we must work in the remote parts of the country, such as Strandzha-Sakar, the Rodopi and the 4th and 5th functional areas, and when pressure from the outside, as was emphasized here, is increasing. With three vehicles per 100 geological scientists as against one car per almost one project geologist one could hardly speak of the full-fledged use of the academy's cadre potential, fast expert evaluations and suitability of developments for practical application.

Second, our laboratory and equipment facilities are insufficient, even compared to some neighboring countries.

Third, the average age of the scientific workers, more than one half of whom are women, is 50. This is an age which, unlike the age of women engaged in other professions, is quite symptomatic and cannot be compensated for only by some intensification features. Frequently the retirement of an associate eliminates the only competent specialist we have in his field without having given him the opportunity to train his replacement, if he is a scientific associate, for instance. These difficulties may be common to the entire BAN, but it is obvious that the BAN Geology Institute needs greater concern and attention, consistent with the country's needs.

Academician Vladimir Topencharov

I would like to draw the attention of our scientific forum to the part of the report entitled "Popularization of Science and Scientific Accomplishments."

I have not been a member of this house long, but to the best of my recollection the BAN leadership has not previously devoted so much space -- seven full pages -- to the topic of popularizing science and scientific accomplishments, precisely in the spirit of the class-party approach so extensively discussed in the resolutions of the 12th BCP Congress. The report precisely notes, quite accurately and timely, and even with a certain delay I would say, that (and I quote) "Of late activities considered to be of an auxiliary nature in scientific and technical creativity have begun to play a very important independent social role by making their contribution to the spiritual enrichment of society and helping to resolve specific scientific and technical problems. Through such activities, i.e., through popularization, the academy helps to shape and strengthen a Marxist scientific outlook among our people, to enhance the reputation and prestige of Bulgarian science, and to accelerate the practical use of science."

Although this section is not particularly well drafted, it makes an important and accurate statement, namely about the need for our scientific workers to participate in the work of the mass information media -- the press, television, radio, mass popular lectures, talks and exhibitions. The report reviews the participation, although still too small, of some BAN organs in the mass propaganda media in 1982, justifiably considering it a positive manifestation in the activities of scientific workers. Thus the BAN leadership asserts the view that it is no sin for a scientific worker to be a publicist. The scientific worker can and must disseminate scientific successes and experience, science itself, among the people. The report contains the accurate conclusion that the academy and the mass information media must cooperate even more closely and actively in such a way as to make even greater contributions to the enhancement of the academy's prestige and that of the Bulgarian scientists, and to help our public realize even better the tremendous role which it plays in the spiritual and material enrichment of the Bulgarian people. At the same time, however, or even before that, the scientific workers must acquire an understanding of the need to participate in the work of the mass information media. We must admit, however, that a significant percentage of our people underestimate this necessity.



The report mentions the old idea that the dissemination of scientific information and publications has not only scientific but sociopolitical, economic and propaganda purposes, which are directly related to the mass information media. This accurate view has not been applied in the practical work of many of our scientific units, centers, cadres, publications, and editorial boards.

It is also true, as the report notes, that few scientific workers are good popularizers. Above all, however, we must surmount the underestimating of the involvement of scientific workers with the mass information media. Our mass information media are eagerly awaiting the pen of the scientific worker, the scientific worker of the BAN and our universities above all.

There was talk here of the need to assert the authority of the scientific worker. No one could assert this authority better than the scientific worker himself, precisely through the mass information media. This requirement must be accepted in our circle, and only then will the Scientific Propaganda Council, which was created under the BAN Presidium at the end of 1982, be able to perform its important and noble social mission.

It is not a question of self-advertising, and that is not the wish of the academy. Its wish is to provide scientific knowledge to those who will be applying such knowledge in production and life. The mass utilization of science and scientific accomplishments cannot be achieved without the mass popularization of scientific knowledge. It is true that a certain skill and even professionalism is required in the popularization of science. However, this calls not only for talent or gift but mainly habit.

#### Concluding Words by Academician Angel Balevski

Allow me to say a few words on what was said here and on our accountability meeting in general.

Let me start with Comrade Topencharov because he was the last to speak and his statement is still very fresh in my memory. He touched on a very important matter which, actually, we too discussed -- the popularization of science. This is an extremely serious matter which we have quite clearly underestimated. It is true that the obstacles are numerous. We have not set up a proper machinery. Nor have our people, our scientists, developed the habit to popularize their achievements. It is said that Leonard Oyler could present even the most abstract mathematical problem in such a way that even a child could grasp its essence. In the final account, not every one has the gift, but every one has a profound knowledge of his field. Furthermore, our people know how to write, and should write. I see from our press that some people are specialized in sports writing. However, we have no journalists who are specialists in writing on scientific matters, perhaps because we are a small country, who knows? Perhaps young people should be encouraged to specialize in this area. We shall always welcome any journalist who would like to attend a session of the BAN Presidium, to listen to what is being discussed and to assess it from the standpoint of an outsider, who can consider problems with a certain understanding, who understand what it is all about.

The academy has reached a level at which it could yield produce much more than it is currently. This requires a very small increase in personnel, for this cannot be accomplished without it. New areas are being developed, and in each one of them there must be a small basic number of people who can work and create something new. This is one side of the problem. The most important, however, is the rationalization of the labor process and the enhancement of scientific work. How is this to be accomplished? The only known way is by having a place where the people can work and the availability of equipment which will facilitate and, with the automation of scientific experimentation, raise their work to a higher level, with the help of more auxiliary personnel. We cannot assume that the entire personnel of all institutes will consist of geniuses. Suffice it for a large institute to have ten creative individuals. The others may be respected scientists without whom the ideas of those who generate them cannot be successfully implemented. What matters is for every one to find his proper place and to act in an organized fashion and in accordance with the needs, abilities and possibilities of those at work. Something else: in addition to the problems under development and the target problems, we must work on some very special ones. This is already being done, i.e., problems are being crystallized on the basis of the requirements which will ensure the future of the nation. Let me give a few examples.

The question pertains to energy. We have a Ministry of Power Supply which has a very high standard. It has its very smart programs, as we know. We also have another national energy program on how to supply the country with energy in the immediate future. However, the academy must have its own program which should not be subject to the pressure of daily requirements but be based above all on forecasts, on what we must work on in Bulgaria. In accordance with what mother Bulgaria, the sacred Bulgarian soil give us, we must determine the directions of our scientific searches in order to acquire a scientific potential and ensure the future solution of the energy problem which will always be important to us.

It is also a question here of scientific instrument making and the element base. We cannot be economically independent and hope for results in the economic struggle unless, as I mentioned, we rely on the latest technologies which cannot be achieved without scientific instrument making, automation and an element base. This is another problem which the BAN must resolve, for it is very difficult and complex and can be dealt with only by a comprehensive scientific research institution which could also organize other forces outside the academy. Extensive such forces exist outside the academy -- the other academies, the higher educational institutions and the departmental institutes have people working on a high scientific level.

The food complex is another problem.

Naturally, we must start with the stipulation of what our people should eat. We have a Medical Academy which will tell us that. Our people will eat what the soil produces. We have an Agricultural Academy, whose personnel know their work. However, some complex problems arise, such as, for example, a conflict with nature. In the pursuit of high yields we launch into a sharp struggle against nature. By this I mean not only herbicides, pesticides, chemical fertilizers and so on, about which we do not know how long our soil



can endure them. Many other ecological problems legitimately arise, toward which the academy should and must not remain inactive.

The question of biotechnologies was also discussed.

There are institutions dealing with biotechnologies. However, in this case we reach into the most delicate aspects of biology. The academy should not ignore such problems as well.

Comrade Sava Ganovski raised the question of the round table discussion which was held here and of our peace-making group under the BAN Presidium. We did not include it in our report, for its current activities will be reported next year. I would like to point out, however, that the academy held a general meeting at which the question of the social sciences was discussed. The scientific and technical revolution is a social phenomenon which is taking place in a socialist society in our country and in a capitalist society in America. They cannot be the same. Here we must take the person into consideration. A great deal has been and will be said on this matter until we can develop a link, build a bridge between the social humanities and the natural sciences.

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## BULGARIA

### INTERNATIONAL ORGANIZATION STUDIES DANUBE RIVER

Sofia SPISANIE NA BULGARSKATA AKADEMIYA NA NAUKITE in Bulgarian No 4, 1983  
pp 100-102

[Article by Senior Scientific Associate Boris Rusev: "International Organization for the Study of the Danube River"]

[Text] The Danube is the most important river in the world from the international viewpoint, for it is the only river to cross eight countries with a combined population of 70 million. With its 2,890 km length, a basin of some 800,000 square meters and average runoff of some 6,500 m<sup>3</sup> per second it is the second largest river in Europe. It is a major water artery which the eight European countries use according to their various requirements. The increasingly developing trade and passenger navigation is a prerequisite for the even closer interconnection among the national economies of these countries, the study of their cultures and all-round achievements, and the development of sincere and lasting friendship among these nations.

The growing needs and requirements of the Danube countries and the steady expansion of their industrial potential and settlements along the river brought about a gradual worsening of the quality of the water and the threat of epidemics. At the same time they increased demand for the fuller utilization of the Danube waters for the production of electric power, water supplies to settlements and industries, and preserving and even increasing fishing, recreation and water sports.

All of this led Austrian Prof Dr Reinhard Leepolt to suggest as early as 1956, at the 13th International Limnology\* Congress (Helsinki, Finland) the establishment of a nongovernmental International Organization for the Study of the Danube River (Internationale Arbeitsgemeinschaft Donauforschung -- IAD) with headquarters and secretariat in Vienna. The warmly welcomed suggestion made at the congress met with a quick response by all Danube countries: The FRG, Austria, Czechoslovakia, Hungary, Yugoslavia, Bulgaria, Romania and the USSR. That same year the first conference of the newly-created organization was held in Vienna under the chairmanship of its president, Prof Dr Leepolt.

The first four conferences (1956-1959) were held in Vienna. The fifth, described as the "Travelling Symposium on Danube River Problems," was held aboard the "Amur," a modern Soviet passenger vessel, as it sailed from Vienna to the Danube River estuary on the Black Sea. The ship's good facilities were used to demonstrate the various methods used in river studies. We demonstrated the

\* Limnology is the science of continental water reservoirs.

use of the the Petersen dredge in collecting benthos from the river bottom. At that conference Switzerland was granted membership in the organization because of its relatively large Danubian tributary, the Inn.

Subsequent conferences were held almost every year, consecutively in all the Danube countries (Hungary, 1961 and 1972; Czechoslovakia, 1962 and 1973; Poland, 1964 and 1974; FRG, 1964 and 1975; Bulgaria, 1966 and 1976; USSR, 1967 and 1978; Yugoslavia, 1969 and 1979; Switzerland, 1970 and 1981; and Austria, 1982). Sharing experience, methods, views and results and lively debates on a variety of theoretical and practical problems created conditions for the fast, overall and extensive study of the river's condition by the different countries. The organization adopted bylaws. The management consisted of a president, a secretary and representatives of each Danube country. Ten work groups were set up on the most important scientific disciplines and trends: water physics and chemistry, radiology, hydromicrobiology and hygiene, phytoplankton and phytobenthos, zooplankton, zoobenthos, ichthyology and fishing, saprobiology, balance of substances and the Danube delta. The most outstanding scientists in the respective areas were elected heads of the work groups.

The results of a decade of work were summed up in the monograph "Danube River Limnology," published in the FRG in 1967. National monographs on Danube limnology were also published by the USSR in 1961, Czechoslovakia in 1966, Poland in 1967 and Bulgaria in 1978.

Since 1967 the studies have followed an approved 10-year program. The present decade ends in 1986, when their results will be summed up in Czechoslovakia.

The 25th anniversary of the founding of the organization was celebrated in 1982, at the 23rd Danube Conference, in Vienna. The results of its overall activities were summed up by the organization's leadership in the book "Twenty-Five Years of International Organization for the Study of the Danube River," which was distributed at the conference. The 25-year balance exceeded all expectations. From the least studied river in Europe, the Danube became one of the most completely and profoundly studied rivers in the world. In addition to the mentioned monographs almost 3,000 scientific works have been published on various problems related to the Danube River.

A "Danube River Bibliography" (from 1900 to 1980) is scheduled to come out in Romania in 1984. It too is the result of the collective efforts of Danube country scientists. Preparations are currently under way for the printing of a second expanded and updated edition of the "Danube River Limnology," which will include new chapters of practical value to the comprehensive utilization of the river. Steps are being taken for the gradual publication of national monographs on the limnology of Danube tributaries of each Danube country.

Since 1957 Bulgaria has actively participated in all measures promoted by the international organization for the study of the Danube River. Until 1971 it was represented by Corresponding Member Al. Vulkanov, the founder of Bulgarian hydrobiology. In 1963 the "Danube River Zoobenthos" and in 1969 also the "Danube River Zooplankton" work groups were headed by Bulgarian scientists (Rusev and Naydenov). Between 1970 and 1982 these groups held 12 conferences on standardizing and improving methods and other specific problems related to improving Danube studies along these ecological directions. The papers

presented at the 10th and 19th anniversary Danube conferences, held on the occasion of the 10th anniversary of the founding of the organization, were published as collections by the BAN Press in 1968 and 1979.

Two of our scientists (Rusev and Velez) were the authors of separate sections of the "Danube River Limnology," (1967) and 18 Bulgarian authors participated in the compilation of the collection "Limnology of the Bulgarian Sector of the Danube River" (BAN Press, Sofia, 1978).

Twelve institutes, teams and departments are engaged in comprehensive studies of Danube limnology. They are from the Zoology Institute, which is also the studies coordinator, the Hydrology and Meteorology Institute, the Water Problems Institute, the Geography Institute, the Botanical Institute and Garden of the Bulgarian Academy of Sciences, the Hydrobiology and Fishing Chair of the Biology Department, Sofia University, the Vodokanalproekt and Energoproekt institutes of the Ministry of Construction and Construction Materials, the Hygiene-Epidemiological Inspectorate of the Ministry of Public Health and the Administration for Maintaining the Waterway and the Study of the Danube River in Ruse, the Marine Research and Oceanography Institute of the BAN and the Fish Resources Institute of the National Agroindustrial Union in Varna.

The following studies were made within the framework of the Bulgarian-Austrian Scientific and Technical Cooperation Agreement and the International Organization for the Study of the Danube River: the phyto- and zooplankton and zoobenthos of the Austrian Danube River Sector, by Bulgarian scientists; the bacteriological condition of the Bulgarian Danube River sector, by Austrian scientists; and the condition of ground waters in the Karaboaz Depression, with the help of radiological methods, by Bulgarian and Austrian scientists. The results were discussed at the 1981 symposium which was held in Sofia. The publishing house of the BAN is preparing for publication in German of a collection of materials based on the joint studies. The results of the studies pertaining to the Danube were also reported at the 23rd Danube River Conference, which was held in Vienna in 1982.

The great importance of the International Organization for the Study of the Danube River and its results will be appreciated even better following the completion and commissioning of the Rhine-Main-Danube and Oder-Elbe-Danube canals, which will link the North and Baltic seas to the Black Sea. The forthcoming transformation of the Danube into a system of dams is another major task facing the Danube limnologists, for the already extant hydro-engineering complexes are exerting a major influence on the overall biological regimen of the Danube River.

The positive initial impetus attained in the comprehensive study of the Danube within the framework of the organization should be preserved and expanded for the good of all Danubian countries.

The long and fruitful joint work accomplished by the Danube River scientists in a spirit of understanding and mutual aid must be the base and symbol of comprehensive international cooperation under conditions of peace and understanding among all Danube countries.

UNOFFICIAL SALE OF U.S. COMPUTERS YIELDS VAST PROFITS

Budapest OTLET in Hungarian 6 Oct 83 pp 22, 23

[Article by Zsuzsa Lang: "Public Interest--Private Crimes"]

[Text] "To net 50,000 forints with an investment of 9,000 schillings is not a bad investment."

One must defend the interests of the national economy. And the "private importers" of personal computers are, in the opinion of the police, "committing acts in violation of the law, thus causing damage to the national economy, and they must answer for their deeds in accordance with the magnitude of the economic damage."

The leader of the police authority conducting the investigation is right. There can be no disputing that income acquired without work belongs among the deeds dangerous to society, the law punishes the offering of forints or the changing of illegally smuggled foreign exchange--and it is a fact that some of the "travellers" finance the computers brought in from these sources.

It is also a pregnant truth that to net 50,000 forints with an investment of 9,000 schillings is not a bad deal, but it would be very unjust to view this "profiteering" (Criminal Code, Section 299) in isolation from time and space without regard to the social (natural) medium. From the viewpoint of passing judgment it must be admitted that these deals--in the majority of cases certainly illegal--would never have come to be without an upset of the balance of supply and demand, if the personal computers arriving via the Vienna channel did not make up a real shortage, and if the computers which can be obtained here at home were not even more expensive and a good bit less "intelligent" than their illegal fellows. And if the already hard market-economic difficulties were not made worse by political and military policy bans and complications (embargo), and if the "receivers of stolen goods"--all those who eagerly awaited and gladly paid for machines imported legally, with a customs receipt--were not large state enterprises and national institutions.

It is somehow difficult to accept the "accessory" title given to the Fotoelektronik Industrial Cooperative, for several reasons. According to the

charge affecting the cooperative Fotoelektronik had an interest in keeping the high takeover prices because it could get a higher profit even on the basis of the profit key. This assumption is a lame one because Fotoelektronik offers a guarantee for 12 percent while OFOTERT will not for this amount. It would for 15--if it had a well built system of contacts similar to that of Fotoelektronik. Unfortunately this well constructed "service path" also became one of the charges against the cooperative: "It wanted to legalize trade in the illegally imported machines with the experts trained for maintenance and repair." It appears very probable that the cooperative did not really think that it had to legalize its activity, for its license authorized its services.

As for the prices, or more precisely the difference between domestic prices and those out there, the leaders of the police investigation asked the opinion of an expert at the Miskolc Heavy Industry Technical University. Here are a few quotations from the opinion:

"The microcomputers of extraordinary importance from the economic viewpoint (the Commodore and its peripherals) coming in privately enter trade cheaply in comparison to the prices and capabilities of other similar products in domestic trade... They are a bit more expensive compared to the recalculated Western European prices, but over the long run the price trend shown is decreasing. Thus, over the long run, it can be expected that these prices will become realistic within months, if the import is not stopped, after the Western European prices are recalculated and duties and an acceptable minimum profit are added (due also to a moderation in demand). In the event of import obstacles one can expect a jump in the price of the machines already in the country. In the event of continuing import, however, there will be increasing tension between domestic manufacturers and trade and those selling machines imported privately--because of the relatively low price and greater capacity of the imported machines....

"There are no products of similar capacity and intelligence on the domestic market (from the side of hardware and software alike).... Equipment capable of substantially less is sold in small numbers, with long waiting lines and at places improporionately more expensive compared to the prices studied....

"The microcomputers are representatives of a developed technology and are very efficient tools of production. This is why the enterprises and institutes are seeking them, taking into consideration their easily recognized and well conceived interests. They are willing to pay for them even the highest price which can be justified. In general they are purchased by computer technology experts who are well aware of the Western prices and are willing to pay high, but not unrealistic, prices."

Virtually everyone in this computer case is defending the interests of the national economy. The authorities against the travellers, some of whom have committed foreign exchange crimes, but all of whom without exception are guilty of profiteering. The profiteers, who are dealing in shortage items which can be used well in the economy, and not in hi-fi's, television sets or cosmetics. The Fotoelektronik Industrial Cooperative, because it is



providing modern, high capacity personal computers for the combat worthy large enterprises of the economy and (even) for their guiding organs. And the enterprises and institutes, because they are investing in modern tools of production at what is a realistic price even in this way.

So who is finally right?

Perhaps even the most intelligent Commodore does not know the answer.

[A photograph with the article carries the following caption and prices: "Commodore prices here and there. The FRG prices (DM) are from the Vobis list published on 12 September. The forint prices are the consumer prices of Fotoelektronik. Commodore 64, basic machine, 675 DM, 91,000 forints; Floppy disk (disk drive), 675 DM, 79,500 forints; Printer, 875 DM, 91,000 forints; Magnetic card (floppy disk), 6 DM, 680 forints."]

#### A Computer Crime Story

"Trade has increased 20 times in one year."

"Against how many people have you started proceedings?"

"The crimes of the more than 1,000 perpetrators under investigation, or rather the seriousness of them, can be divided into various groups or categories.... This group handled about 150 million forints, and even if we divide this in a differentiated way among more than 1,000 people it is a very serious sum on the scale of the national economy, considering the harm done to the state!" (Lessons of the computer case, a conversation with police colonel Dr Ferenc Repasi, ESZAK MAGYARORSZAG, 17 September 1983.)

Public opinion could learn in detail for the first time from the extensive article appearing in the Miskolc daily about what had been talked about for months in the groves of computer technology, the authorities had cited hundreds of amateur importers of computers and peripherals arriving with customs receipts.

It is well known that tourism always indicates very quickly and sensitively where there is a considerable difference between the foreign and domestic prices for consumer articles. The path has led from the pocket radio invasion of the 1960's through the pocket calculator import of the 1970's to the hit article of today, the personal computer. In every period the packages of travellers have been filled with those goods which could be sold here at home with an extraordinarily high profit. The criminal proceedings now underway give a typical picture. A Commodore 64 computer purchased in Vienna for 9,000 schillings (about 24,000 forints) is taken over here at home for nearly 100,000 forints by cooperative and state trade for sale on consignment. The profit of the tourist is reduced by the duty paid, which even in the case of the foregoing computer category varies over a broad scale--depending on one's luck. On 13 April 1983, for example, the Customs and Finance Guard valued such a basic machine at 14,000 forints (the duty imposed being 3,672 forints) while on 2 May, for example, the same organ of the Customs and

Finance Guard estimated the value of a VC 64 at 120,000 forints and obliged the traveller to pay 48,500 forints.

Although very many firms deal with the takeover of technical articles the name of one small cooperative has come into the spotlight in connection with the present case. A good number of the Commodore computers and peripherals coming in are taken over on consignment by the Fotoelektronik Industrial Cooperative. Trade by the Miskolc unit of the cooperative has increased 20 times in one year.

The president of the cooperative, Geza Papp, shows a heavy dossier. Orders from state enterprises, scientific institutes, hospitals, educational institutions, producer cooperatives and central press organs. The cooperative delivers the machines to the customer, together with the other units required, with unexampled speed, often the next day. Experts install the delicate equipment and the cooperative--unique in the practice of similar firms--also offers a guarantee on the computers sold by it. It is understandable that orders have flooded and are flooding Fotoelektronik, because the special trade enterprise will undertake delivery only with a good bit longer time limit and naturally to the burden of the capitalist exchange budget of the purchaser. Fotoelektronik sells for forints.

"How did the cooperative get into the focus of the case and how did it become the number one domestic importer of the Commodore machines?"

"For a long time our cooperative has had the right to buy and sell used industrial articles. We have been buying pocket calculators for years and when personal computers appeared on the Western market at a cheap price they also were offered to the cooperative for sale. According to the valid regulations we can take over articles with a domestic value higher than 5,000 forints only if the seller proves customs handling with a clearance paper. At first we also purchased every model, but we had to admit that we could not provide a guarantee for them or repairs beyond the guarantee. For this reason, taking into consideration the opinion of recognized Hungarian experts and of the foreign professional press, we decided to prepare ourselves for repair of the Commodore machines. In the interest of this we signed a cooperation contract with the Novotrade Company. Novotrade provides us with training of our service engineers in England and offers aid for parts acquisition to the burden of their own foreign exchange budget. Novotrade prepares programs for this equipment, and sells them.

"It is an accustomed practice in the technical consignment trade for those finally returning from a mission abroad and for others interested, having a foreign exchange account, to inquire as to what goods should be taken over. We naturally informed our agents that we were preparing to trade in Commodore machines. In any case, we do this at a 12 percent profit, and from this profit margin we cover the cost of the guarantee service. The young experts of our largest provincial service unit, the Miskolc unit, undertook to install the machines and repair them throughout the country. Engineers, in addition to technicians, aid this work here."

WAYS SOUGHT TO MAKE HUNGARIAN-JAPANESE S&T AGREEMENTS MORE PRODUCTIVE

Budapest FIGYELO in Hungarian 13 Oct 83 p 11

[Article by Ferenc Pichler: "Hungarian-Japanese Scientific and Technical Cooperation"]

[Text] In 1977, the National Technical Developmental Committee signed a scientific and technical cooperation agreement with one of the largest Japanese concerns, the Mitsui group. The Mitsui group includes hundreds of Japanese robotics, electronics, chemical, steel and metallurgical enterprises. Among others, the famous Toshiba is also a member of the group. Besides an extensive production and sales network, the Japanese enterprises also have a significant research and development base, which creates favorable conditions for scientific and technical cooperation with their Hungarian partners.

In spite of this, there have been relatively few achievements in the transfer of advanced technologies, determined the Hungarian-Japanese scientific and technical cooperation sessions held between 3 and 5 October, in the National Technical Developmental Committee [OMFB]. This is not fully explained by the significant geographical separation of the two countries. During the past 6 years, we were unsuccessful in establishing the mutual interests of the partners. The cooperation has mostly been limited to the one-sided application of Japanese technologies in Hungary. In the Lenin Metallurgical Works, for example, computerized production control was organized with the application of Japanese methods; Japanese procedures are used in the plastics manufacturing industry and the production of plastic foils. In the United Incandescent Factory, the processing of wolfram filaments necessary for the production of incandescent lamps has been modernized by technology imported from the Far Eastern country, and the Hungarian Post automated the selection and sorting of mail in cooperation with the Toshiba Company.

At the Budapest session--where the possibilities of cooperation were explored in the chemical and pharmaceutical industries, metallurgy and the processing of metals, electronics and the automation of production control--emphasis was placed on mutuality. Precisely for this reason, the representatives of Novex and Licencia revealed several Hungarian intellectual products to the Japanese experts. For example, Licencia

offered water filter and purifier elements produced from scrap plastics, capable of the water removal of roads, highways, airports and the separation of mechanically purified water. The intellectual product is a service patent of UVATERV. Strong interest was generated among the Japanese businessmen by the Hungarian procedure allowing the separation and utilization of iron dust, parallel to the regeneration of hydrochloric acid in the hydrochloric acid pickling solution used in ferrous metallurgy. Special equipment was developed for the reduction in Hungary; with its use, the process can be accelerated and the procedure is more economical than the methods used abroad.

Novex recommended the fast reactor developed by the researchers of Chinoi to the Japanese partners. Since the specific heat exchange surface of the equipment is twice or five times as large as that of conventional reactors the chemical reaction can be performed in less time and with reduced costs, which improves economy.

At the three-day session, the foreign experts reported the significant progress made in the development of economic technologies by the ferrous metallurgical, steel and metal processing enterprises of the Mitsui group. In order to make part of the methods applicable also in Hungary, they made the collection of the procedures available to the experts of the OMFB. At the session, we agreed that cooperation will also be increased in the processing of plastics and scrap plastics, the utilization of plastic foils in agriculture, trade of insecticides, the joint research and development of certain preparations. Conditions are good for cooperation also in the pharmaceutical industry and electronics. This latter would be advantageous because it would help the Hungarian experts in the faster implementation of the national microelectronics program.

Obviously, Hungary is not indifferent to the acceleration of the acceptance of advanced technology. An extension of the Hungarian-Japanese scientific and technical cooperation can also contribute to a more dynamic and balanced expansion of trade and cooperative relations. In the last few years, we were unable to significantly expand the cooperation with Japanese enterprises. At the present, Hungarian and Japanese enterprises cooperate based on four production and product specialization contracts, while there are over five hundred cooperations with developed industrial nations.

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CSO: 2502/13

## HUNGARY

### HUNGARY ACQUIRES VERSATILE PROGRAM PACKAGE FROM HOSKYNS GROUP

Budapest SZAMITASTECHNIKA in Hungarian Oct 83 pp 1-2

[Summary] To comply with a fundamental objective of the Computer Technology Development Program, namely to make the benefits of computer applications accessible to a broad segment of the economy, SZAFA [Szamitastechnikai Alkalmazfejlesztési Alap, Computer Technology Applications Fund] was established under the control of the Central Statistical Office. SZAFA is charged with finding and acquiring the most versatile software packages for Hungary. In the 1978-1982 period of its operation SZAFA acquired program packages valued at over 100 million forints. Expenditures amounted to 43 million and 48 million forints in 1981 and 1982 respectively.

Purchase of the programs through SZAFA have cost the country far less than purchases by individual users would have. For example, in the case of the recently acquired MAS-M [Modular Applications Systems for Minicomputers] purchase of the right to nationwide distribution by SZAFA amounted to only 2.5 times the fee for individual use. Support of the institutions in charge of the packages has eliminated multiple attempts at adaptation to specific user needs as well as time-consuming duplication of effort. SZAFA had to find programs that could be run on SZM-4, TPA-1140, TPA-1148 and SZM-52 small computers. Programs prepared by and for Hungarian enterprises cannot be used on SZM machines.

The MAS-M purchased from Hoskyans Group Ltd from SZAFA funds cost 20 million forints including customs fees and foreign trade expenses and meets Hungarian requirements most completely. The system consists of units written in accordance with modern programming techniques. The marketers of MAS-M guarantee delivery, methodology, training and any consultation needed in the course of implementation. Along with the program package, Hungary received the SDM [systems designing method] which is independent of MAS-M applications and can thus be of aid in preparing enterprise application systems for large computers.

In the past SZAFA put a single institution in charge of domestic dissemination of program packages. Now, the aim is to have the greatest possible number of institutions participate simultaneously in such dissemination.

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